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(दूसरा पुनरीक्षण)

Indian Standard

GOLD SOLDERS FOR USE IN MANUFACTURE OF JEWELLERY — SPECIFICATION

(*Second Revision*)

ICS 39.060

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1999 Price Group 1

Precious Metals Sectional Committee, MTD 10

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Precious Metals Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was earlier published in 1965 and subsequently revised in 1981. In this revision the use of cadmium has been dispensed with because of its toxicity to human organs. This change is in line with national health requirements, international practices as well as requirements of jewellery exporters. On request of the jewellery industry and keeping the contemporary needs in mind the compositions of cadmium free yellow solder and white solders have been incorporated in Tables 1, 2 and 3 which are in accordance with international practice.

There is no international standard for solders for use in manufacture of gold jewellery.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified in this standard.

AMENDMENT NO. 1 JUNE 2003
TO
IS 3095 : 1999 GOLD SOLDERS FOR USE IN MANUFACTURE OF JEWELLERY — SPECIFICATION

(*Second Revision*)

(*Page* 1, *clause* 5) — Substitute the following for the existing clause:

'5 MANUFACTURE

Gold solders shall be made from fine gold of fineness 995 or above as prescribed in IS 1417 and silver and base metal of minimum fineness of 999 parts per thousand ($^0/_{00}$) and free from other harmful elements. The base metal content may vary to get desired colour and other physical characteristics but the gold content shall remain unchanged as per the respective grades as per 4.1 of IS 1417.'

[*Page* 2, *Table* 2, *Sl No.* (xi), *last column*] — Substitute '925' *for* '895'.

(MTD 10)

Reprography Unit, BIS, New Delhi, India

Indian Standard

GOLD SOLDERS FOR USE IN MANUFACTURE OF JEWELLERY — SPECIFICATION

(Second Revision)

1 SCOPE

This standard lays down the requirements for gold solders for use in the manufacture of gold jewellery/ artefacts of 23, 22, 21, 18, 14 and 9 carat.

2 REFERENCE

The following standard contains provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below:

IS No.	*Title*
1417 : 1999	Gold and gold alloys, jewellery/ artefacts — Fineness and marking — Specification

3 GRADES

The cadmium free yellow and white gold solders shall be of the following grades in carat:

Cadmium Free Yellow Gold Solders	*Cadmium Free White Gold Solders*
a) 22	a) 18
b) 21	b) 14
c) 18	c) 9
d) 14	
e) 9	

NOTE — For articles/ornaments of 23 carat, solder of grade 22 may be used, provided the skin purity of 23 carat gold alloy is kept slightly on higher side so that the melting purity conforms to the declared quality/grade.

4 FORM

The solders used shall preferably be in form of paste. However other forms like sheet, wire, strip, snippet etc may also be used subject to condition that the final purity of the jewellery is as declared and conforms to the prescribed grades.

5 MANUFACTURE

Gold solders shall be made from fine gold of fineness 995 or above as prescribed in IS 1417 and silver and base metal of minimum fineness of 999 parts per thousand (‰) and free from from Hg, Pb, Cd, Ni, As, Se, Te and platinum group metals etc.

6 TYPICAL CHEMICAL COMPOSITIONS

Typical chemical compositions of various grades of gold solders are given in Tables 1, 2 and 3.

7 PACKING

The material shall be suitably packed to avoid any damage during transport.

8 MARKING

8.1 The package or the container of the solder shall be marked as below:

a) Manufacturer's name and identification mark,
b) Batch number, and
c) Grade and purity.

8.2 BIS Certification Marking

The solder may also be marked with the Standard Mark.

8.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Table 1 Typical Chemical Composition of Cadmium Free Yellow Gold Solders

(*Clause* 6)

Sl No.	Grades in Carat		Metals, Percent by Mass						Melting Range[1] °C	
			Au	Ag	Cu	Zn	In	Ga	Solidus Temperature	Liquidus Temperature
i)	9	Easy	37.50	31.88	18.13	8.12	3.12	1.25	637	702
ii)		Medium	37.50	29.38	19.38	10.62	2.50	0.62	658	721
iii)		Hard	37.50	38.60	23.10	—	0,80	—	850	870
iv)	14	Easy	58.33	13.34	15.00	8.75	4.58	—	669	741
v)		Medium	58.33	14.50	14.25	9.17	3.75	—	660	745
vi)		Hard	58.33	14.16	14.58	10.00	2.93	—	668	748
vii)	18	Easy	75.00	6.25	8.50	5.50	4.75	—	730	765
viii)		Medium	75.00	5.75	9.50	6.00	3.75	—	682	767
ix)		Hard	75.00	5.25	12.25	6.50	1.00	—	792	829
x)	21	Easy	87.50	4.00	3.50	5.00	—	—	834	897
xi)		Medium	87.50	—	5.50	4.80	2.20	—	751	840
xii)		Hard	87.50	—	8.50	—	4.00	—	786	894

Table 2 Typical Chemical Composition of Cadmium Free Yellow Gold Solders

(*Clause* 6)

Sl No.	Grades in Carat		Metals, Percent by Mass					Melting Range[1] °C	
			Au	Ag	Cu	Zn	In	Solidus Temperature	Liquidus Temperature
i)	9	Easy	37.80	33.10	21.10	5.50	2.50	750	780
ii)		Medium	37.80	36.10	22.10	3.00	1.00	800	820
iii)		Hard	37.80	38.60	23.10	—	0.50	850	870
iv)	14	Easy	58.53	18.00	15.47	5.00	3.00	720	760
v)		Medium	58.53	21.00	16.97	2.00	1.50	750	770
vi)		Hard	58.53	22.47	17.00	2.00	—	800	620
vii)	18	Easy	75.20	5.80	11.00	5.00	3.00	700	740
viii)		Medium	75.20	6.90	13.10	2.80	2.00	750	770
ix)		Hard	75.20	8.80	13.20	1.80	1.00	820	840
x)	22	Easy	91.80	2.40	2.00	1.00	2.80	850	895
xi)		Medium	91.80	3.00	2.60	1.00	1.60	900	895
xii)		Hard	91.80	4.20	3.00	1.00	—	940	960

Table 3 Typical Chemical Composition of Cadmium Free White Gold Solders

(*Clause* 6)

Sl No.	Grades in Carat		Metals, Percent by Mass					Melting Range[1] °C	
			Au	Ag	Cu	Ni	Zn	Solidus Temperature	Liquidus Temperature
i)	9	Easy	37.50	29.10	15.20	10.00	8.20	763	784
ii)		Hard	37.50	31.20	16.20	12.00	3.10	800	832
iii)	14	Easy	58.33	15.75	5.00	5.00	15.92	707	729
iv)		Hard	58.33	15.75	11.00	5.00	9.92	800	833
v)	18	Easy	75.00	—	6.50	12.00	6.50	803	834
vi)		Hard	75.00	—	1.00	16.50	7.50	888	902

[1] Melting ranges are given for guidance only. Solidus is the temperature at which the solder starts melting and liquidus is the temperature at which the solder is completely liquid.

NOTE — Composition of cadmium free gold solders given in Tables 1, 2 and 3 are indicative and not exhaustive. The base metal contents may vary to get desired colour and other physical characteristics, but gold content shall remain unchanged as per respective grades as per 3.1.

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This Indian Standard has been developed from Doc : No. MTD 10 (4281).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at : Prabhat Offset Press, New Delhi-2